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Hamilton, II et al.

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(54) **TURNING PAGES OF AN ELECTRONIC DOCUMENT BY MEANS OF A SINGLE SNAP GESTURE**

(71) Applicant: **International Business Machines Corporation**, Armonk, NY (US)

(72) Inventors: **Rick A. Hamilton, II**, Charlottesville, VA (US); **Andrew R. Jones**, Round Rock, TX (US); **Mauro Marzorati**, Lutz, FL (US); **Brian M. O'Connell**, Cornwallis, NC (US)

(73) Assignee: **International Business Machines Corporation**, Armonk, NY (US)

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G06F 3/0485	(2013.01)
G06F 3/0488	(2013.01)
G06F 3/044	(2006.01)

(52) **U.S. Cl.**

CPC ***G06F 3/0483*** (2013.01); ***G06F 1/1626*** (2013.01); ***G06F 3/044*** (2013.01); ***G06F 3/0485*** (2013.01); ***G06F 3/04883*** (2013.01)

(58) **Field of Classification Search**

CPC G06F 3/044; G06F 3/0483; G06F 3/0485; G06F 3/0488; G06F 3/04883; G06F 15/0283; G06F 15/0291; G06F 1/626

USPC 345/173; 715/863, 864

See application file for complete search history.

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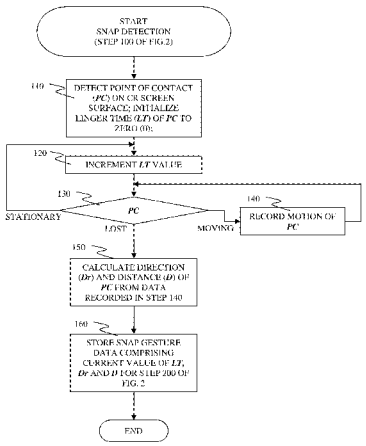
Primary Examiner — Tom Sheng

(74) *Attorney, Agent, or Firm* — Schmeiser, Olsen & Watts, LLP; Matthew Chung

(57) **ABSTRACT**

A system and associated method for contextualizing a page turn in an electronic book pursuant to a snap gesture made by a user on a touch screen of a tablet device, as performed by an e-reader program running in the tablet device. The snap gesture is quantified with data elements including linger time and direction of the snap gesture. The quantified snap gesture is utilized in identifying a target page number to display on the touch screen responsive to at least one predefined data element of the quantified snap gesture such that the user is enabled to turn multiple pages of the electronic book by the snap gesture as turning multiple pages of a paper book.

16 Claims, 5 Drawing Sheets



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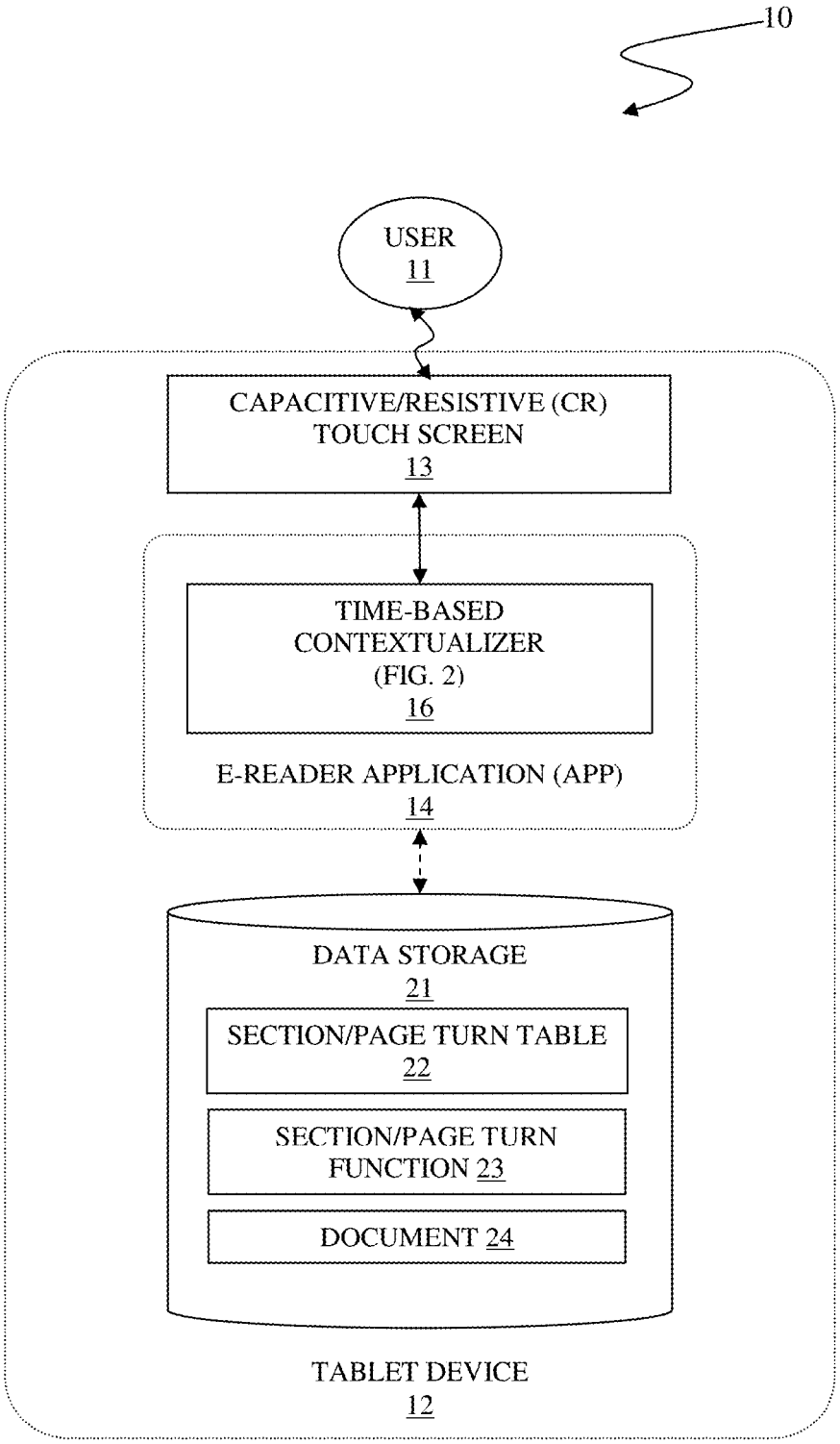
10
USER
11
CAPACITIVE/RESISTIVE (CR)
TOUCH SCREEN
13
TIME-BASED
CONTEXTUALIZER
(FIG. 2)
16
E-READER APPLICATION (APP)
14
DATA STORAGE
21
SECTION/PAGE TURN TABLE
22
SECTION/PAGE TURN
FUNCTION 23
DOCUMENT 24
TABLET DEVICE
12

FIG. 1

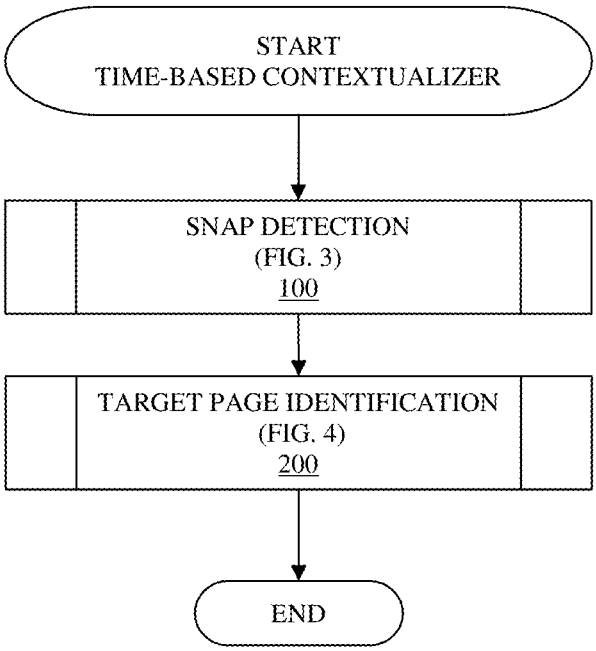
START
TIME-BASED CONTEXTUALIZER
SNAP DETECTION
(FIG. 3)
100
TARGET PAGE IDENTIFICATION
(FIG. 4)
200
END

FIG. 2

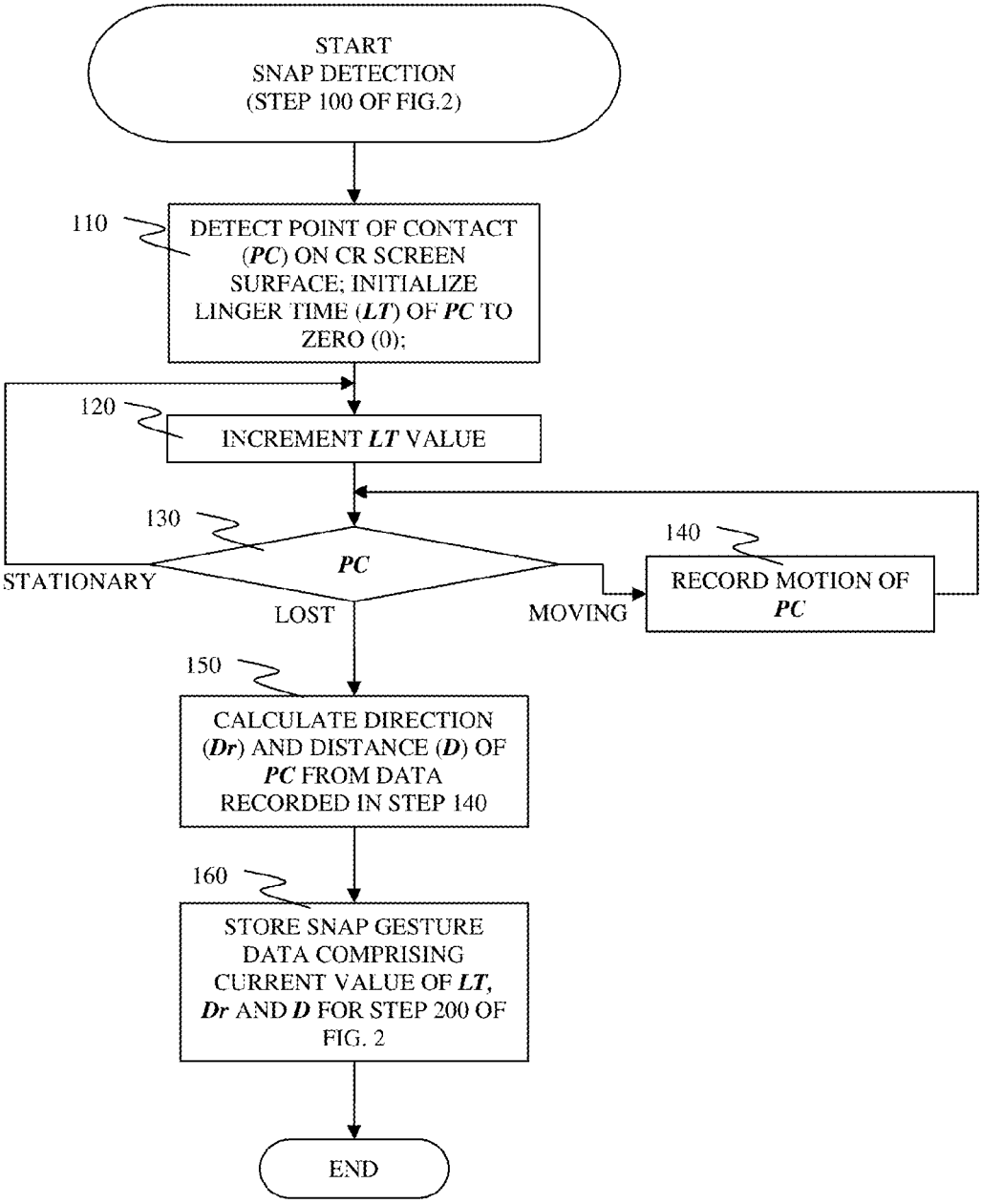
START
SNAP DETECTION
(STEP 100 OF FIG.2)
110
DETECT POINT OF CONTACT (PC) ON CR SCREEN SURFACE; INITIALIZE LINGER TIME (LT) OF PC TO ZERO (0);
120
INCREMENT LT VALUE
130
PC
STATIONARY
LOST
MOVING
140
RECORD MOTION OF PC
150
CALCULATE DIRECTION (Dr) AND DISTANCE (D) OF PC FROM DATA RECORDED IN STEP 140
160
STORE SNAP GESTURE DATA COMPRISING CURRENT VALUE OF LT, Dr AND D FOR STEP 200 OF FIG. 2
END

FIG. 3

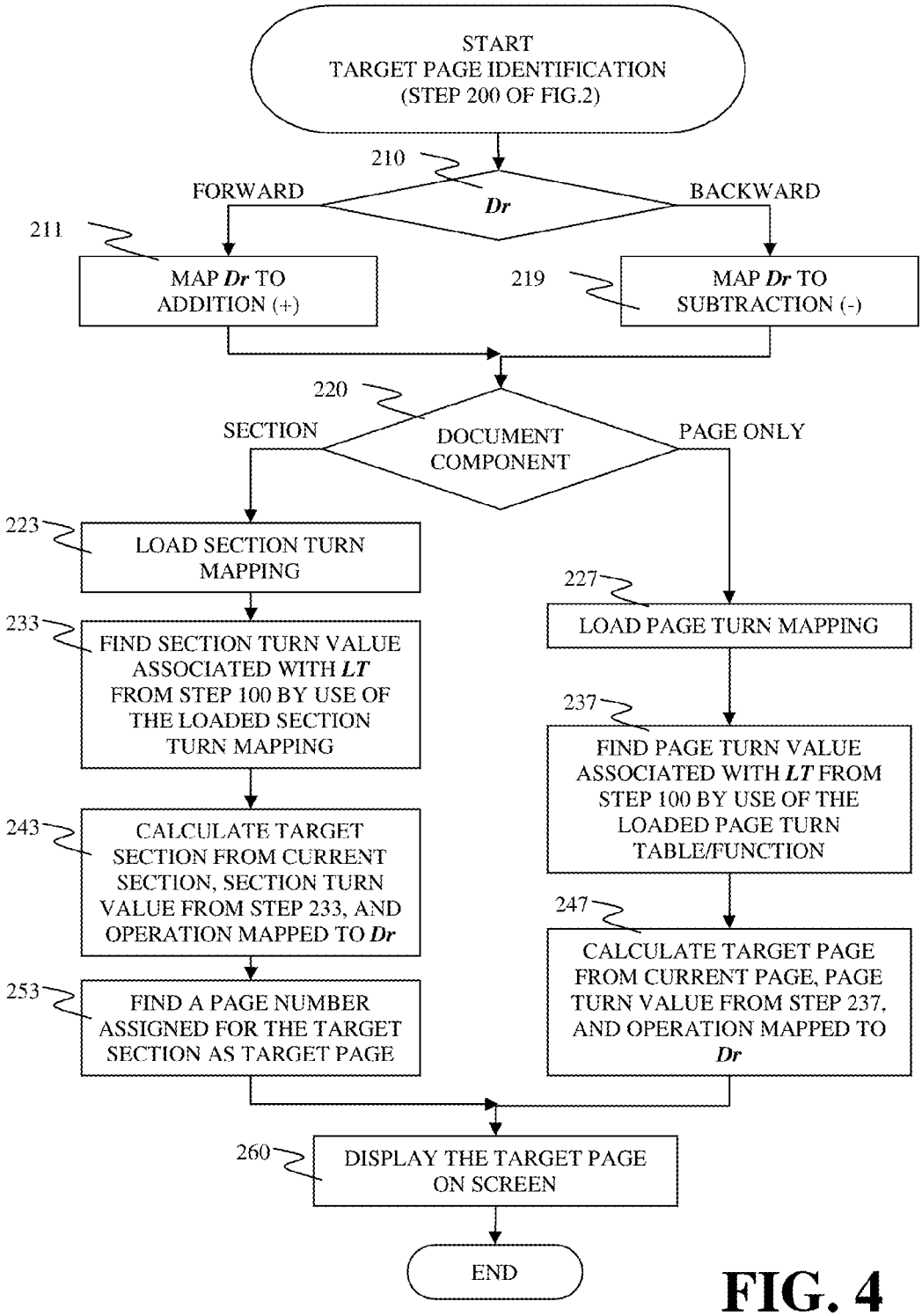
START
TARGET PAGE IDENTIFICATION
(STEP 200 OF FIG.2)
210
Dr
FORWARD
BACKWARD
211
MAP Dr TO
ADDITION (+)
219
MAP Dr TO
SUBTRACTION (-)
220
DOCUMENT
COMPONENT
SECTION
PAGE ONLY
223
LOAD SECTION TURN
MAPPING
227
LOAD PAGE TURN MAPPING
233
FIND SECTION TURN VALUE
ASSOCIATED WITH LT
FROM STEP 100 BY USE OF
THE LOADED SECTION
TURN MAPPING
237
FIND PAGE TURN VALUE
ASSOCIATED WITH LT FROM
STEP 100 BY USE OF THE
LOADED PAGE TURN
TABLE/FUNCTION
243
CALCULATE TARGET
SECTION FROM CURRENT
SECTION, SECTION TURN
VALUE FROM STEP 233, AND
OPERATION MAPPED TO Dr
247
CALCULATE TARGET PAGE
FROM CURRENT PAGE, PAGE
TURN VALUE FROM STEP 237,
AND OPERATION MAPPED TO
Dr
253
FIND A PAGE NUMBER
ASSIGNED FOR THE TARGET
SECTION AS TARGET PAGE
260
DISPLAY THE TARGET PAGE
ON SCREEN
END

FIG. 4

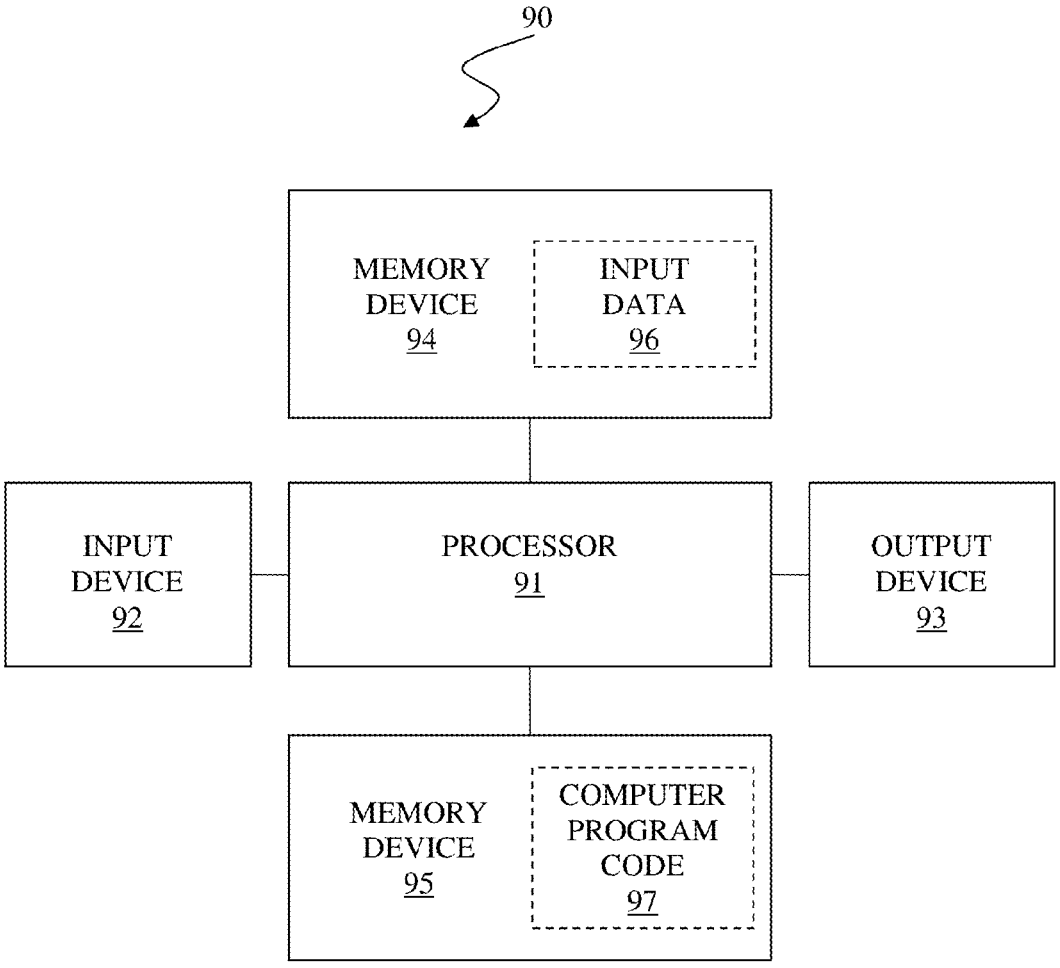
90
MEMORY DEVICE 94
INPUT DATA 96
INPUT DEVICE 92
PROCESSOR 91
OUTPUT DEVICE 93
MEMORY DEVICE 95
COMPUTER PROGRAM CODE 97

FIG. 5

TURNING PAGES OF AN ELECTRONIC DOCUMENT BY MEANS OF A SINGLE SNAP GESTURE

This application is a continuation application claiming priority to Ser. No. 13/410,705, filed Mar. 2, 2012, now U.S. Pat. No. 8,773,381 issued Jul. 8, 2014.

BACKGROUND

The present invention discloses a system and associated method for grouping multiple pages of an electronic book proportional to a gesture of a user interacting through a touch screen with an electronic book reader application, which improves user-friendliness of the e-book reader application by making browsing the e-book feel like browsing of traditional books. Conventional e-reader applications support sequential turning of pages one by one, forward or backward, going directly to a beginning or an end of a document, or directly turning to a specific page when the user provides a page number in a document.

BRIEF SUMMARY

According to one embodiment of the present invention, a method for contextualizing a page turn in an electronic book pursuant to a snap gesture made by a user on a touch screen of a tablet device, wherein said method is performed by an e-reader program running in the tablet device, said method comprises: quantifying the snap gesture, responsive to receiving the snap gesture via the touch screen, wherein the quantified snap gesture comprises a first data element of direction of the snap gesture (Dr) and a second data element of linger time of the snap gesture (LT); identifying a target page number for the page turn in the electronic book by use of the quantified snap gesture; and displaying, on the touch screen, a target page of the electronic book that corresponds to the target page number from said identifying.

According to one embodiment of the present invention, a computer program product comprises a computer readable memory unit that embodies a computer readable program code. The computer readable program code contains instructions that, when run by a processor of a computer system, implement contextualizing a page turn in an electronic book pursuant to a snap gesture made by a user on a touch screen of a tablet device.

According to one embodiment of the present invention, a computer system comprises a processor, a memory coupled to the processor, and a computer readable storage device coupled to the processor, said storage device containing program code configured to be executed by the processor via the memory to implement contextualizing a page turn in an electronic book pursuant to a snap gesture made by a user on a touch screen of a tablet device.

According to one embodiment of the present invention, a process for supporting computer infrastructure, said process comprising providing at least one support service for at least one of creating, integrating, hosting, maintaining, and deploying computer-readable code in a computing system, wherein the code in combination with the computing system is capable of performing contextualizing a page turn in an electronic book pursuant to a snap gesture made by a user on a touch screen of a tablet device.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. **1** illustrates a system **10** for time-based contextualizing of multiple pages for an e-reader application **14** employed in a tablet device **12**, in accordance with embodiments of the present invention.

FIG. **2** is a flowchart depicting a method for time-based contextualizing of multiple pages for the e-reader application in FIG. **1**, as performed by the time-based contextualizer, in accordance with the embodiments of the present invention.

FIG. **3** is a flowchart depicting snap detection performed by the time-based contextualizer in step **100** of FIG. **2**, in accordance with the embodiments of the present invention.

FIG. **4** is a flowchart depicting target page identification performed by the time-based contextualizer in step **200** of FIG. **2**, in accordance with the embodiments of the present invention.

FIG. **5** illustrates a computer system **90** used for time-based contextualizing of multiple pages for an e-reader application employed in a tablet device, in accordance with the embodiments of the present invention.

DETAILED DESCRIPTION

FIG. **1** illustrates a system **10** for time-based contextualizing of multiple pages for an e-reader application **14** employed in a tablet device **12**, in accordance with embodiments of the present invention.

The system **10** comprises a user **11** and the tablet device **12**. The tablet device **12** comprises a capacitive/resistive (CR) touch screen **13**, the e-reader application **14** and data storage **21**. The user **11** operates the e-reader application **14** by interacting with the CR touch screen **13** in accessing documents stored in the data storage **21**.

The CR touch screen **13** is a touch screen of a type utilizing capacitance or resistance property of electricity. The CR touch screen **13** recognizes a location where the user **11** contacts on the CR touch screen **13**, and duration how long the user **11** continues the contact made on respective locations. The user **11** may use, inter alia, a finger, a stylus, etc., in making the touch motions on the CR touch screen **13**.

The e-reader application **14** comprises a time-based contextualizer **16** which enables the user **11** to turn arbitrary number of pages of the document by interacting with the CR touch screen **13** with a snap gesture. The snap gesture comprises an initial contact and a sweeping motion, wherein the initial contact is made upon the user **11** touching the CR touch screen **13** at a contact point, and wherein the sweeping motion refers to a unidirectional movement of the contact point along the CR touch screen **13** following the initial contact. The CR touch screen **13** captures the snap gesture data and subsequently transfers the captured snap gesture data to the e-reader application **14**. In this specification, the snap gesture data comprises linger time (LT), direction (Dr), and distance (D), wherein LT is defined as a period of time during the user **11** lingers on the contact point, calculated as a difference between the time of the initial contact (T**0**) and the beginning of the sweeping motion (T**1**), that is LT=(T**1**−T**0**), wherein Dr is selected from a group consisting of {forward, backward} indicating the direction of the sweeping motion, and wherein D is defined as a track length of the sweeping motion on the CR touch screen **13**. See FIG. **2** infra for steps performed by the time-based contextualizer **16**.

The data storage **21** comprises a section/page turn table **22**, a section/page turn function **23**, and a document **24**. The document **24** is an electronic book displayed on the CR touch screen **13** that the user **11** is viewing and turning pages with snap gestures. The section/page turn table **22** and the section/page turn function **23** are utilized by the e-reader application **14** to calculate a number of pages to turn based on LT, Dr, and D of the snap gesture data captured by the CR touch screen **13** as currently given by the user **11**. In this specification, the term "section" is used to indicate a subcomponent of the

document **24** that divides the document **24** into disjoint groups of pages, and is used interchangeably with any other term indicating such subunit of the document such as, inter alia, part, chapter, etc.

The section/page turn table **22** and the section/page turn function **23** are employed in calculating the number of pages to turn by the time-based contextualizer **16**. See descriptions of FIG. **2** infra for details of the section/page turn table **22** and the section/page turn function **23** as used by the time-based contextualizer **16**.

FIG. **2** is a flowchart depicting a method for time-based contextualizing of multiple pages for the e-reader application in FIG. **1** supra, as performed by the time-based contextualizer, in accordance with the embodiments of the present invention.

In step **100**, the time-based contextualizer detects snap gesture made by the user. See description of FIG. **3** infra for detailed operations of step **100**. Then the time-based contextualizer proceeds with step **200**.

In step **200**, the time-based contextualizer identifies a target page of the document to display in accordance with the snap gesture detected from step **100** supra. See description of FIG. **4** infra for detailed operations of step **200**. Then the time-based contextualizer terminates processing the snap gesture.

FIG. **3** is a flowchart depicting snap detection performed by the time-based contextualizer in step **100** of FIG. **2** supra, in accordance with the embodiments of the present invention.

In step **110**, the time-based contextualizer detects a point of contact (PC) for the snap gesture on the capacitive/resistive (CR) touch screen of the tablet device, on which the user interacts with the tablet device for page turning. Then the time-based contextualizer proceeds with step **120**.

Steps **120** through **140** are repeatedly performed while the PC exists, that is while the user maintains a continuous contact on the CR touch screen. The time-based contextualizer initializes linger time (LT) value of the PC to zero (**0**) only when the time-based contextualizer proceeds with step **120** from step **110** supra. Upon losing the PC indicating that the user discontinues the contact detected as the PC in step **110** supra, then the time-based contextualizer proceeds with step **150** infra.

In step **120**, the time-based contextualizer increments the LT value by one (**1**) to represent a lapse of one (**1**) predefined time unit. In other embodiment of the present invention, the LT value may be incremented by other predefined number for a fixed number of clock cycles. Then the time-based contextualizer proceeds with step **130**.

In step **130**, the time-based contextualizer determines whether or not the PC makes the sweeping motion of the snap gesture by moving on the CR touch screen surface. If the time-based contextualizer determines that the PC moves on the CR touch screen surface, then the time-based contextualizer proceeds with step **140**. If the time-based contextualizer determines that the PC stands still on the CR touch screen surface, then the time-based contextualizer loops back to step **120**.

In step **140**, the time-based contextualizer records the sweeping motion of the snap gesture as determined in step **130** supra. Then the time-based contextualizer loops back to step **130**.

In step **150**, the time-based contextualizer calculates direction (Dr) value and distance (D) value of the snap gesture, respectively, based on sweeping motion data recorded in step **140** supra, because a current snap gesture has concluded by the user. Then the time-based contextualizer proceeds with step **160**.

In step **160**, the time-based contextualizer stores Dr value, D value, respectively calculated from step **150**, and LT value resulting from at least one run of step **120** as data associated with the current snap gesture and make the current snap gesture data values available to step **200** of FIG. **2** supra for target page identification. Then the time-based contextualizer proceeds with step **200** of FIG. **2** supra.

FIG. **4** is a flowchart depicting target page identification performed by the time-based contextualizer in step **200** of FIG. **2** supra, in accordance with the embodiments of the present invention.

In step **210**, the time-based contextualizer determines whether Dr value of the snap gesture data generated in step **100** of FIG. **1** supra is either "forward" or "backward". If the time-based contextualizer determines that the Dr value of the snap gesture data is "forward", then the time-based contextualizer proceeds with step **211**. If the time-based contextualizer determines that the Dr value of the snap gesture data is "backward", then the time-based contextualizer proceeds with step **219**.

In step **211**, the time-based contextualizer maps the Dr value to a mathematical addition (+) operation for following steps as the snap gesture is directed forward as represented by the Dr value "forward". Then the time-based contextualizer proceeds with step **220**.

In step **219**, the time-based contextualizer maps the Dr value to a mathematical subtraction (−) operation for following steps as the snap gesture is directed backward as represented by the Dr value "backward". Then the time-based contextualizer proceeds with step **220**.

In step **220**, the time-based contextualizer determines whether or not the document is organized in sections grouping pages into disjoint groups. If the time-based contextualizer determines that the document is organized in sections as the disjoint groups of pages, then the time-based contextualizer proceeds with step **223**. If the time-based contextualizer determines that the document is not organized in subcomponent but has only pages, then the time-based contextualizer proceeds with step **227**. In other embodiment of the present invention, wherein the document has more than two subcomponents hierarchically grouping pages, steps **223**, **233**, **243**, and **253** are repeated as a unit for a next level of subcomponent of the document until the time-based contextualizer finds a target page.

In step **223**, the time-based contextualizer loads a section turn mapping selected from a section turn table and a section turn function, from the data storage to memory. In one embodiment of the present invention, either a section turn table or a section turn function is implemented for the time-based contextualizer to map the snap gesture to a respective section turn value. In another embodiment of the present invention, both the section turn table and the section turn function are implemented and the user selects which one to use in configuration settings of the tablet device. In the same embodiment, the section turn table consists of four (**4**) section turn table records, {0, 0.1, 1}, {0.1, 0.2, 2}, {0.2, 0.5, 5}, and {0.5, MaxLT, MaxSecTrn}, wherein first two columns of a section turn table record represent a respective range of linger time (LT) values, wherein a first column represents a lower bound of the respective range of LT values, wherein a second column represents an upper bound of the respective range of LT values, and a third column represents a section turn value corresponding to the first two columns of the respective section turn table record, such that a first section turn table record {0, 0.1, 1} indicates that a first range of LT values between zero (**0**) and 0.1 seconds corresponds to a first section turn value of one (**1**), a second section turn table record {0.1, 0.2,

2} indicates that a second range of LT values between 0.1 and 0.2 seconds corresponds to a second section turn value of two (**2**), a third section turn table record {0.2, 0.5, 5} indicates that a third range of LT values between 0.2 and 0.5 seconds corresponds to a third section turn value of five (**5**), and a fourth section turn table record {0.5, MaxLT, MaxSecTrn} indicates that a fourth range of LT values greater than 0.5 seconds up to a predefined maximum linger time value MaxLT corresponds to a fourth section turn value of a maximum number of section turns in the document MaxSecTrn. In another embodiment of the present invention, the section turn function maps LT to a section turn value associated with each LT, that is, f(LT)→SecTrn, wherein LT represents a value from Linger Time domain, and wherein SecTrn represents a value from Section Turn domain. Then the time-based contextualizer proceeds with step **233**.

In step **233**, the time-based contextualizer finds a section turn value associated with LT of the snap gesture in the section turn mapping loaded in step **223** supra. Then the time-based contextualizer proceeds with step **243**.

In step **243**, the time-based contextualizer calculates a target section based on a current section, the section turn value from step **233** supra, and the operation mapped in steps **210**, **211** or **219** supra, wherein the current section indicates a section value in the document at time of detecting the snap gesture. Then the time-based contextualizer proceeds with step **253**.

In step **253**, the time-based contextualizer determines a predefined page number in the target section as a target page to display. The predefined page number may be, inter alia, a random page number within the target section, a smallest page number of the target section, etc. Then the time-based contextualizer proceeds with step **260**.

In step **227**, the time-based contextualizer loads a page turn mapping for following steps. In one embodiment of the present invention, a page turn table consists of four (**4**) page turn table records, {0, 0.1, 5}, {0.1, 0.2, 10}, {0.2, 0.5, 15}, and {0.5, MaxLT, MaxPgTrn}, wherein first two columns of a page turn table record represent a respective range of linger time (LT) values, wherein a first column represents a lower bound of the respective range of LT values, wherein a second column represents an upper bound of the respective range of LT values, and a third column represents a page turn value corresponding to the first two columns of the respective page turn table record, such that a first page turn table record {0, 0.1, 5} indicates that a first range of LT values between zero (**0**) and 0.1 seconds corresponds to a first page turn value of five (**5**), a second page turn table record {0.1, 0.2, 10} indicates that a second range of LT values between 0.1 and 0.2 seconds corresponds to a second page turn value of ten (**10**), a third page turn table record {0.2, 0.5, 15} indicates that a third range of LT values between 0.2 and 0.5 seconds corresponds to a third page turn value of fifteen (**15**), and a fourth section turn table record {0.5, MaxLT, MaxPgTrn} indicates that a fourth range of LT values greater than 0.5 seconds up to a predefined maximum linger time value MaxLT corresponds to a fourth page turn value of a maximum number of page turns in the document MaxPgTrn. For the same embodiment wherein a page turn function is utilized, the page turn function of LT maps to a page turn value for each LT, that is, f(LT)→PgTrn, wherein LT represents a value from Linger Time domain, and wherein PgTrn represents a value from Page Turn domain. Then the time-based contextualizer proceeds with step **237**.

In step **237**, the time-based contextualizer finds a page turn value associated with LT of the snap gesture in the page turn mapping loaded in step **227** supra. Then the time-based contextualizer proceeds with step **247**.

In step **247**, the time-based contextualizer calculates a target page to based on a current page, the page turn value from step **237** supra, and the operation mapped in steps **210**, **211** or **219** supra, wherein the current page indicates a page number value in the document at time of detecting the snap gesture. If the operation is an addition, then the target page results from advancing the page turn value from the current page. If the operation is a subtraction, then the target page results from taking the page turn value from the current page such that the page advancement is reversed. Then the time-based contextualizer proceeds with step **260**.

In step **260**, the time-based contextualizer display the target page calculated in step **253** or step **247**, supra, on the CR touch screen of the tablet device. Then the time-based contextualizer terminates processing the current snap gesture.

FIG. **5** illustrates a computer system **90** used for time-based contextualizing of multiple pages for an e-reader application employed in a tablet device, in accordance with the embodiments of the present invention.

The computer system **90** comprises a processor **91**, an input device **92** coupled to the processor **91**, an output device **93** coupled to the processor **91**, and memory devices **94** and **95** each coupled to the processor **91**. In this specification, the computer system **90** represents any type of programmable data processing apparatus.

The input device **92** is utilized to receive input data **96** into the computer system **90**. The input device **92** may be, inter alia, a keyboard, a mouse, a keypad, a touch screen, a scanner, a voice recognition device, a sensor, a network interface card (NIC), a Voice/video over Internet Protocol (VOIP) adapter, a wireless adapter, a telephone adapter, a dedicated circuit adapter, etc. The output device **93** is utilized to communicate results generated by the computer program code **97** to a user of the computer system **90**. The output device **93** may be, inter alia, a printer, a plotter, a computer screen, a magnetic tape, a removable hard disk, a floppy disk, a NIC, a VOIP adapter, a wireless adapter, a telephone adapter, a dedicated circuit adapter, an audio and/or visual signal generator, a light emitting diode (LED), etc.

Any of the components of the present invention can be deployed, managed, serviced, etc. by a service provider that offers to deploy or integrate computing infrastructure with respect to a process for time-based contextualizing of multiple pages for the e-reader application of the present invention. Thus, the present invention discloses a process for supporting computer infrastructure, comprising integrating, hosting, maintaining and deploying computer-readable code into a computing system (e.g., computing system **90**), wherein the code in combination with the computing system is capable of performing a method for time-based contextualizing of multiple pages for the e-reader application.

In another embodiment, the invention provides a method that performs the process steps of the invention on a subscription, advertising and/or fee basis. That is, a service provider, such as a Solution Integrator, can offer to create, maintain, support, etc., a process for time-based contextualizing of multiple pages for the e-reader application of the present invention. In this case, the service provider can create, maintain, support, etc., a computer infrastructure that performs the process steps of the invention for one or more customers. In return, the service provider can receive payment from the customer(s) under a subscription and/or fee agreement, and/or the service provider can receive payment from the sale of advertising content to one or more third parties.

While FIG. **5** shows the computer system **90** as a particular configuration of hardware and software, any configuration of hardware and software, as would be known to a person of ordinary skill in the art, may be utilized for the purposes stated supra in conjunction with the particular computer system **90** of FIG. **5**. For example, the memory devices **94** and **95** may be portions of a single memory device rather than separate memory devices.

As will be appreciated by one skilled in the art, aspects of the present invention may be embodied as a system, method or computer program product. Accordingly, aspects of the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Furthermore, aspects of the present invention may take the form of a computer program product embodied in one or more computer readable medium(s) having computer readable program code embodied thereon.

Any combination of one or more computer readable medium(s) may be utilized. The computer readable medium may be a computer readable signal medium or a computer readable storage medium. In this specification, the term "memory device" **94**, **95** represents a computer readable storage medium. A computer readable storage medium may be, for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing. More specific examples (a non-exhaustive list) of the computer readable storage medium would include the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the foregoing. In the context of this document, a computer readable storage medium may be any tangible medium that can contain, or store a program for use by or in connection with an instruction execution system, apparatus, or device.

A computer readable signal medium may include a propagated data signal with computer readable program code embodied therein, for example, in baseband or as part of a carrier wave. Such a propagated signal may take any of a variety of forms, including, but not limited to, electro-magnetic, optical, or any suitable combination thereof. A computer readable signal medium may be any computer readable medium that is not a computer readable storage medium and that can communicate, propagate, or transport a program for use by or in connection with an instruction execution system, apparatus, or device.

Program code embodied on a computer readable medium may be transmitted using any appropriate medium, including but not limited to wireless, wireline, optical fiber cable, radio frequency (RF), etc., or any suitable combination of the foregoing.

Computer program code **97** for carrying out operations for aspects of the present invention may be written in any combination of one or more programming languages, including an object oriented programming language such as Java, Smalltalk, C++ or the like and conventional procedural programming languages, such as the "C" programming language or similar programming languages. The computer program code **97** may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

Aspects of the present invention are described with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems) and computer program products according to embodiments of the invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. The term "computer program instructions" is interchangeable with the term "computer program code" **97** in this specification. These computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

These computer program instructions may also be stored in a computer readable storage medium that can direct a computer, other programmable data processing apparatus, or other devices to function in a particular manner, such that the instructions stored in the computer readable storage medium produce an article of manufacture including instructions which implement the function/act specified in the flowchart and/or block diagram block or blocks.

The computer program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other devices to cause a series of operational steps to be performed on the computer, other programmable apparatus or other devices to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide processes for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

The flowchart and block diagrams in the Figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods and computer program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the block may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or flowchart illustration, and combinations of blocks in the block diagrams and/or flowchart illustration, can be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

The corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims are intended to include any structure, material, or act for performing the function in combination with other claimed elements as specifically claimed. The description of the

present invention has been presented for purposes of illustration and description, but is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the invention. The embodiment was chosen and described in order to best explain the principles of the invention and the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

What is claimed:

1. A method for turning pages of an electronic document by means of a single snap gesture performed on a capacitive touch screen of a tablet device, the method comprising:

the tablet device displaying a current page of the electronic document on the capacitive touch screen, wherein the electronic document comprises a plurality of pages, and wherein the plurality of pages comprises the current page; and

the tablet device time-quantifying the snap gesture, responsive to receiving the snap gesture via the capacitive touch screen, wherein the time-quantified snap gesture comprises a first data element of direction of the snap gesture (Dr) and a second data element of a linger time of the snap gesture (LT),

wherein the time-quantifying comprises:

the tablet device detecting a point of contact on the capacitive touch screen that initiates the snap gesture on the capacitive touch screen at a first point in time T**0**;

the tablet device determining that the point of contact starts moving at a second point in time T**1** through a third time T**2**, wherein T**1** is greater than T**0** and T**2** is greater than T**1**;

the tablet device recording movement of the point of contact while the point of contact exists on the capacitive touch screen, wherein the point of contact exists until time T**2**;

the tablet device calculating the linger time LT as being equal to (T**1**-T**0**);

the tablet device calculating a movement time MT as being equal to (T**2**-T**1**);

the tablet device calculating Dr from the recorded movement of the point of contact, wherein the calculated Dr is selected from a group consisting of {forward, backward};

the tablet device storing the calculated Dr and LT as the time-quantified snap gesture;

the tablet device identifying a target page in the electronic document, wherein the identifying is performed as a function of the time-quantified snap gesture, and wherein the plurality of pages comprises the target page; and

the tablet device displaying the target page on the capacitive touch screen.

2. The method of claim **1**, wherein the time-quantifying further comprises:

the tablet device calculating a third data element of distance of the snap gesture (D), wherein D identifies a track length made by the point of contact during the movement time MT; and

the tablet device storing the calculated D, Dr, and LT as the time-quantified snap gesture.

3. The method of claim **1**, the identifying comprising:

the tablet device mapping Dr to a respective mathematical operation corresponding to each Dr value, wherein a first Dr value "forward" corresponds to addition (+), and wherein a second Dr value "backward" corresponds to subtraction (−);

the tablet device determining that the electronic document is organized into a plurality of sections, wherein a first section of the plurality of sections comprises a first set of pages of the electronic document, and wherein no other section of the plurality of sections comprises a page of the first set of pages;

the tablet device discovering a section turn value corresponding to the time-quantified snap gesture;

the tablet device calculating a target section number by applying the mathematical operation corresponding to Dr from the mapping to a current section value and to the discovered section turn value, wherein the current section value is a section value being displayed when the snap gesture is received, and wherein the section of the plurality of sections that is associated with the calculated target section number comprises the target page; and

the tablet device selecting the target page number pursuant to a predefined manner.

4. The method of claim **1**, the identifying comprising:

the tablet device mapping Dr to a respective mathematical operation corresponding to each Dr value, wherein a first Dr value "forward" corresponds to addition (+), and wherein a second Dr value "backward" corresponds to subtraction (−);

the tablet device determining that the electronic document is organized into a plurality of sections of disjoint pages within the electronic document; and

the tablet device discovering a page turn value corresponding to the time-quantified snap gesture; and

the tablet device calculating a target page number of the target page by applying the mathematical operation corresponding to Dr from the mapping to a current page value and the discovered page turn value, wherein the current page value is a page value being displayed when the snap gesture is received.

5. The method of claim **4**, wherein the plurality of sections are characterized by information stored on a computer-readable hardware storage device in a section/page turn table, wherein the section/page turn table further associates the discovered page turn value with a range of values of LT.

6. The method of claim **1**, further comprising providing at least one support service for at least one of creating, integrating, hosting, maintaining, and deploying computer-readable program code in the computer system, wherein the computer-readable program code in combination with the computer system is configured to implement the displaying and time-quantifying.

7. A computer program product, comprising a computer-readable hardware storage device having a computer-readable program code stored therein, the program code configured to be executed by a computerized tablet device to implement a method for turning pages of an electronic document by means of a single snap gesture performed on a capacitive touch screen of the tablet device, the method comprising:

the tablet device displaying a current page of the electronic document on the capacitive touch screen, wherein the electronic document comprises a plurality of pages, and wherein the plurality of pages comprises the current page; and

the tablet device time-quantifying the snap gesture, responsive to receiving the snap gesture via the capacitive touch screen, wherein the time-quantified snap gesture

comprises a first data element of direction of the snap gesture (Dr) and a second data element of a linger time of the snap gesture (LT)),

wherein the time-quantifying comprises:

the tablet device detecting a point of contact on the capacitive touch screen that initiates the snap gesture on the capacitive touch screen at a first point in time T0;

the tablet device determining that the point of contact starts moving at a second point in time T1 through a third time T2, wherein T1 is greater than T0 and T2 is greater than T1;

the tablet device recording movement of the point of contact while the point of contact exists on the capacitive touch screen, wherein the point of contact exists until time T2;

the tablet device calculating the linger time LT as being equal to (T1-T0);

the tablet device calculating a movement time MT as being equal to (T2-T1);

the tablet device calculating Dr from the recorded movement of the point of contact, wherein the calculated Dr is selected from a group consisting of {forward, backward};

the tablet device storing the calculated Dr and LT as the time-quantified snap gesture;

the tablet device identifying a target page in the electronic document, wherein the identifying is performed as a function of the time-quantified snap gesture, and wherein the plurality of pages comprises the target page; and

the tablet device displaying the target page on the capacitive touch screen.

8. The computer program product of claim **7**, wherein the time-quantifying further comprises:

the tablet device calculating a third data element of distance of the snap gesture (D), wherein D identifies a track length made by the point of contact during the movement time MT; and

the tablet device storing the calculated D, Dr, and LT as the time-quantified snap gesture.

9. The computer program product of claim **7**, the identifying comprising:

the tablet device mapping Dr to a respective mathematical operation corresponding to each Dr value, wherein a first Dr value "forward" corresponds to addition (+), and wherein a second Dr value "backward" corresponds to subtraction (−);

the tablet device determining that the electronic document is organized into a plurality of sections, wherein a first section of the plurality of sections comprises a first set of pages of the electronic document, and wherein no other section of the plurality of sections comprises a page of the first set of pages;

the tablet device discovering a section turn value corresponding to the time-quantified snap gesture;

the tablet device calculating a target section number by applying the mathematical operation corresponding to Dr from the mapping to a current section value and to the discovered section turn value, wherein the current section value is a section value being displayed when the snap gesture is received, and wherein the section of the plurality of sections that is associated with the calculated target section number comprises the target page; and

the tablet device selecting the target page number pursuant to a predefined manner.

10. The computer program product of claim **7**, the identifying comprising:

the tablet device mapping Dr to a respective mathematical operation corresponding to each Dr value, wherein a first Dr value "forward" corresponds to addition (+), and wherein a second Dr value "backward" corresponds to subtraction (−);

the tablet device determining that the electronic document is organized into a plurality of sections of disjoint pages within the electronic document; and

the tablet device discovering a page turn value corresponding to the time-quantified snap gesture; and

the tablet device calculating a target page number of the target page by applying the mathematical operation corresponding to Dr from the mapping to a current page value and the discovered page turn value, wherein the current page value is a page value being displayed when the snap gesture is received.

11. The computer program product of claim **10**, wherein the plurality of sections are characterized by information stored on the computer-readable hardware storage device in a section/page turn table, wherein the section/page turn table further associates the discovered page turn value with a range of values of LT.

12. A computer system comprising a computerized tablet device, a memory coupled to the tablet device, and a computer-readable hardware storage device coupled to the tablet device, the storage device containing program code configured to be run by the tablet device via the memory to implement a method for turning pages of an electronic document by means of a single snap gesture performed on a capacitive touch screen of a tablet device, the method comprising:

the tablet device displaying a current page of the electronic document on the capacitive touch screen, wherein the electronic document comprises a plurality of pages, and wherein the plurality of pages comprises the current page; and

the tablet device time-quantifying the snap gesture, responsive to receiving the snap gesture via the capacitive touch screen, wherein the time-quantified snap gesture comprises a first data element of direction of the snap gesture (Dr) and a second data element of a linger time of the snap gesture (LT),

wherein the time-quantifying comprises:

the tablet device detecting a point of contact on the capacitive touch screen that initiates the snap gesture on the capacitive touch screen at a first point in time T0;

the tablet device determining that the point of contact starts moving at a second point in time T1 through a third time T2, wherein T1 is greater than T0 and T2 is greater than T1;

the tablet device recording movement of the point of contact while the point of contact exists on the capacitive touch screen, wherein the point of contact exists until time T2;

the tablet device calculating the linger time LT as being equal to (T1-T0);

the tablet device calculating a movement time MT as being equal to (T2-T1);

the tablet device calculating Dr from the recorded movement of the point of contact, wherein the calculated Dr is selected from a group consisting of {forward, backward };

the tablet device storing the calculated Dr and LT as the time-quantified snap gesture;

the tablet device identifying a target page in the electronic document, wherein the identifying is performed as a function of the time-quantified snap gesture, and wherein the plurality of pages comprises the target page; and

the tablet device displaying the target page on the capacitive touch screen.

13. The system of claim **12**, wherein the time-quantifying further comprises:

the tablet device calculating a third data element of distance of the snap gesture (D), wherein D identifies a track length made by the point of contact during the movement time MT; and

the tablet device storing the calculated D, Dr, and LT as the time-quantified snap gesture.

14. The system of claim **12**, the identifying comprising:

the tablet device mapping Dr to a respective mathematical operation corresponding to each Dr value, wherein a first Dr value "forward" corresponds to addition (+), and wherein a second Dr value "backward" corresponds to subtraction (−);

the tablet device determining that the electronic document is organized into a plurality of sections, wherein a first section of the plurality of sections comprises a first set of pages of the electronic document, and wherein no other section of the plurality of sections comprises a page of the first set of pages;

the tablet device discovering a section turn value corresponding to the time-quantified snap gesture;

the tablet device calculating a target section number by applying the mathematical operation corresponding to Dr from the mapping to a current section value and to the discovered section turn value, wherein the current section value is a section value being displayed when the snap gesture is received, and wherein the section of the plurality of sections that is associated with the calculated target section number comprises the target page; and

the tablet device selecting the target page number pursuant to a predefined manner.

15. The system of claim **12**, the identifying comprising:

the tablet device mapping Dr to a respective mathematical operation corresponding to each Dr value, wherein a first Dr value "forward" corresponds to addition (+), and wherein a second Dr value "backward" corresponds to subtraction (−);

the tablet device determining that the electronic document is organized into a plurality of sections of disjoint pages within the electronic document; and

the tablet device discovering a page turn value corresponding to the time-quantified snap gesture; and

the tablet device calculating a target page number of the target page by applying the mathematical operation corresponding to Dr from the mapping to a current page value and the discovered page turn value, wherein the current page value is a page value being displayed when the snap gesture is received.

16. The system of claim **15**, wherein the plurality of sections are characterized by information stored on the computer-readable hardware storage device in a section/page turn table, wherein the section/page turn table further associates the discovered page turn value with a range of values of LT.

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